THE AMES Astrogram
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AMES RESEARCH CENTER, MOFFETT FIELD
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Ames scientists find clues to the possible origin of life

Duplicating the harsh conditions of cold interstellar space, a team of scientists led by Ames' Dr. Lou Allamandola created primitive cells in a laboratory that mimic the membranous structures found in all living things. These chemical compounds may have played a part in the origin of life.

This breakthrough by NASA researchers is important since some scientists believe that the delivery--by comets, meteorites and interplanetary dust--of similar organic compounds born in interstellar space may have "kick-started" life on Earth.

"Scientists believe the molecules needed to make a cell's membrane, and thus for the origin of life, are all over space. This discovery implies that life could be everywhere in the universe," said Allamandola.

Using common, everyday chemicals, researchers from Ames' astrochemistry lab and the Department of Chemistry and Biochemistry at the University of California, Santa Cruz, created, for the first time, "proto"-cells. These are primitive cells that mimic the membranous structures found in all life forms. "This process happens all the time in the dense molecular clouds of space," Allamandola said.

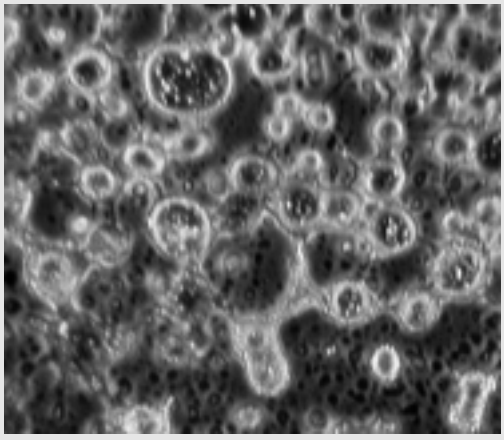
This discovery has important implications for NASA's astrobiology mission. "The formation of these biologically interesting compounds by irradiating simple interstellar ices shows that some of the organics falling to Earth in meteorites and interplanetary dust might have been born in the coldest regions of interstellar space," Allamandola said. "The delivery of these compounds could well have been critical to the origin of life on Earth."

The team's results were published in the special Jan. 30 astrobiology issue of the "Proceedings of the National Academy of Sciences, USA."

Scientists do not yet know whether life began as naked RNA or as genetic material encapsulated in membranes. But at some point, membranes became important.

"All life as we know it on Earth uses membrane structures to separate and protect the chemistry involved in the life process from the outside," said Dr. Jason Dworkin of the SETI Institute, the paper's lead author and a team member. "All known biology uses membranes to capture and generate cellular energy."

"Membranes are like a house," Dworkin added. "Maybe these molecules were just the raw lumber lying around that allowed origin-of-life chemicals to move in and set up housekeeping or construct their own houses."



The droplets pictured above (~10 µm across) show structures reminiscent of cells. They were obtained from a chemically separated fraction of the bulk residue created in the Ames astrochemistry laboratory.

In the lab, the scientists recreated the conditions found in space — which is a cold vacuum — zapping a series of simple ices with the ultraviolet radiation found everywhere. They created solid materials which, when immersed in water, spontaneously created soap bubble-like membranous structures that contained both an "inside" and an "outside" layer.

In contrast to current thinking, this new work shows that the early chemical steps believed to be important for the origin of life do not require an already-formed planet. Instead, they seem to take place in deep space long before planet formation occurs. This implies that the vastness of space is filled with chemical compounds which, if they land in a hospitable environment like our Earth, can readily jump-start life.

Interstellar ices are made of familiar everyday chemicals such as water, methanol (wood alcohol), ammonia and carbon monoxide that are frozen together.

The astrobiology research team also included Dr. Scott Sandford of Ames and David Deamer of the Chemistry and Biochemistry Department of UC Santa Cruz.

Further information about this research is available at: http://web99.arc.nasa.gov/~astrochm/vesicle.html

The research was supported by the Space Science Division at Ames and the Offices of Exobiology and Astrobiology at NASA Headquarters, Washington, D.C. Ames is the agency's lead center for astrobiology and the location of the central office of the NASA Astrobiology Institute, an international research consortium. Astrobiology is the study of the origin, evolution, dispersion and future of life in the universe.

BY KATHLEEN BURTON

Newt Gingrich visits Ames

photo by Tom Trower

Former speaker of the U.S. House of Representatives, Newt Gingrich, paid a visit to Ames on Jan. 25 to explore his interest in biology. Gingrich received briefings on Ames programs in astrobiology, nanotechnology, biotechnology and information technology. Here he is seen chatting with the Ames' Earth Science Division's Dr. Lynn Rothschild about her NAI-funded international research program concerning the potential for transfer of life between planets.

Black History month is here...

February is Black History month, a time for recognizing the contributions of African-Americans and for celebrating the progress that we have made as a people. Dr. Carter Godwin Woodson lead the struggle and search for the truth. He was the one responsible for institutionalizing what was then referred to as 'Negro History Week.' A Harvard-trained Ph.D., Woodson coordinated many meetings, exhibitions, lectures and symposia to climax the scientific study of the African experience throughout the year. His purpose was to provide a more objective and scholarly balance, accurately reflecting the contributions of people of African descent in American and world history. So passionate was he to this cause, Woodson remove himself from the academic mainstream so that he could devote his life to the scientific study of the African experience in America, Africa and throughout the world.

photo by Tom Trower

Lewis Braxton

Those wishing to follow Woodson's example can learn a great deal about African history through the works of a number of distinguished African historians. These include Cheikh Anta Diop, Chancellor Williams, Walter Rodney, Adu Boahen, John Jackson, Yosef Ben-Jochannan, John Hope Franklin, Leronne Bennett Jr., John Henrik Clarke, J. F. Ade Ajayi, and many others. Thanks to their scholarship and documentation, we can come to appreciate that when we talk about African history, we are also talking about African astronomy, African mathematics, African metallurgy, African medicine, African engineering and so much more.

By way of celebration this month, we are highlighting the careers and accomplishments of two African-American employees at the center. Both have distinguished themselves through their contributions and commitment to NASA and to Ames. Each serves as an admirable role model for all of us, regardless of our ethnic or cultural heritage.

Lewis S.G. Braxton III is chief financial officer here at Ames Research Center, having garnered over twenty-two years of experience in service to NASA. He began his career at Dryden Flight Research Center as a co-op student accountant trainee. Subsequently, he earned a Bachelor of Science degree in Business Administration from California State University, Fresno; a Masters of Business Administration degree from Golden Gate University and a PMD from the Harvard Graduate School of Business. His determination, skill and work ethic have served him well in his journey to the very summit of Ames financial management.

Braxton is happily married to wife Venoncia ('Nonnie'), also an Ames employee. Together, they have four children and two grandchildren. Braxton is an outstanding community participant, having served as a den leader of the Webelos for the past three years. He also sponsors numerous annual activities for a large group of Boy Scouts in the local area (approx. 120 boys). This includes such events as space derbies, trips to NASA Ames, and other fun and informative space-related activities. He has coached youth soccer and youth baseball within the community.

Sandra Williams began her government career at Ames in September 1980 as a clerk typist. She pursued a heavy academic and work schedule, advancing her career through a combination of school and progressively more responsible work positions and assignments. She competed for and was awarded a STEP position which allowed her to develop valuable experience working full time at Ames while earning a Bachelor of Science degree in management at Columbia College. She achieved her goal of professional advancement, while simultaneously being a wife and full-time mother of three children (two girls and one boy). She serves as a role model to her children and an important mentor for young girls in her community. Williams has consistently worked to broaden her skills and experiences in financial and resource management. Last March, she accepted a professional development position assignment in the Resources Management Office to serve as that organization's deputy chief. She also serves as Ames' Lead Center Programs resource executive, where she supports Ames senior and program managers in the area of strategic planning. Williams mentors young girls in a church community program called 'Women of Excellence.' She also sponsors young women in their efforts to excel in English, math, the sciences and social activities. She is a volunteer/mentor for other after-school programs and serves as a tutor.

photo by Tom Trower

Sandy Williams

By Mary Buford Howard

Ames scientists simulate hands-off jet landing

continued from back page

technology with two other NASA developments, the ability of the neural net software to learn to fly damaged airplanes, and propulsion-only landing of aircraft.

In about one-sixth of a second, a computer onboard a damaged aircraft can 'relearn' to fly a plane, giving the pilot better control. Severe damage, such as partially destroyed wings, fuselage holes or sensor failures, greatly alter how an airplane handles. Hence, a pilot's controls may respond oddly or might not work at all, according to Jorgensen.

"When we combined the three technologies, the neuroelectrically wired pilot took the simulated aircraft into landing scenarios with a cascading series of accidents, first locking rudder controls and then progressing to full hydraulic failure," said Jorgensen. "For each case, successful landings were demonstrated for autopilot, damaged and propulsion-only control."

Publication-size images that illustrate the Ames technology are available at: http://amesnews.arc.nasa.gov/releases/2001/01images/bioelectric/bioelectric.html

by John Bluck

Exchange Council opens new 'Beyond Galileo' store

On Jan. 29, the Ames Exchange opened their long-awaited new store 'Beyond Galileo' located inside the Ames Café. The new 1,200 sq. ft. store was created with the NASA employee in mind.

The inventory includes fine jewelry, watches, clocks, household items, food, greeting cards, tee shirts, sundries and nicer NASA gifts. There are gifts for both men and women, and at great prices too!

The 'Beyond Galileo' store has the look and feel of a quality mall outlet. Store hours are from 8 a.m. to 2 p.m., Monday through Friday. The store is also the new home for the "tickets and tours" office. That group is reachable at ext. 4-6873 and is your source for transit tickets and discount entertainment.

The hours for the original gift shop at the Visitor Center (building 223) remain 8 a.m. to 4:30 p.m., Monday through Friday. This store also has a new look and will continue to carry NASA and space-related souvenirs. Both stores will have new items coming in all the time. The new friendly staff will make shopping fun! So come by and visit our new stores. For more information, contact the Visitor Center Exchange gift shop at ext. 4-5412 or the Beyond Galileo gift shop at ext. 4-6873.

BY JODI BULAICH

Theresa Martinez (left) and Helen Garcia (right), sales clerks at the Beyond Galileo gift shop, check out their new displays and merchandise.

photos by Astrid Terlep

Evolution of human skin coloration

photo by Tom Trower

On Feb. 1, Drs. Nina Jablonski and George Chaplin presented their research findings which used an ingenious combination of developmental biology, evolutionary biology and remote sensing to pose a novel hypothesis for the origin of human skin coloration. Jablonski is chairman of the Department of Anthropology, California Academy of Sciences. Chaplin is her research associate. The seminar was held in building 239.

JASON XII - A Living Laboratory

This year's JASON project is proving to be just as exciting and educational for kids as in years past. Our youthful visitors were intrigued by the broadcasts from Hawaii shown in the main auditorium, as well as across the nation and the world. Students and teachers watched Dr. Robert Ballard and his team on the Hawaiian Islands, via the live satellite broadcasts, study Hawaii's volcanoes and the unique influence they have on the geology and life there.

After each broadcast, the kids were whisked away by bus to Jason City at the other end of the center. Here they used their building skills in making model volcanoes, their thinking skills in answering various nature questions (on plants and animals) in Hawaii, their artistic skills drawing segments of a picture that was divided into a grid and various other projects aimed to teach them more about the geological makeup of Hawaii.

The United States Geological Survey (USGS) were on hand with their display of volcanic rock samples. They also had an authentic seismograph which actually recorded student-created "quakes" as the students jumped nearby. Diver Dan's Diving School repeated last year's popular exhibit with demonstrations on how to wear and use diving gear. The kids also got a chance to build spider gliders, an activity that showed students how a common lava cave dweller can fly. The spider glider activity was sponsored by RAFT (Resource Area for Teachers). Rock-it Science created a volcano, that, at the end of each session in JASON City, actually erupted. U.S. Space Camp California had activities for the kids dealing with extraterrestrial volcanoes and developing exploratory missions to Mars along with many wonderful photos on display. The Monterey National Marine Sanctuary and MATE Center were on hand with a watershed demonstration. Students participated in a water-cycle activity and learned how important it is to not pollute the Monterery Bay National Marine Sanctuary and how we can help by not dumping toxic chemicals, such as oil into storm drains, since it all ends up in the Bay. An estimated 10,000 plus students attended this year's event. For more information on the JASON project, visit the JASON web site at: http://www.jasonproject.org

BY ASTRID TERLEP

JASON XII - A Living Laboratory

photos by Astrid Terlep

First HDCC workshop on high dependability computing

The first high dependability computing consortium (HDCC) workshop was held at the Numerical Aerospace Simulation facility January 10 to 12 to gather parties interested in making computer software more reliable for the future. Partnering to form HDCC, Carnegie Mellon University and Ames had the same goal in mind—to eliminate computer failures.

"This is an extremely important event for NASA — future missions depend on the long-term success of software reliability and dependability," said Steve Zornetzer, director of information sciences and technology at Ames. "This consortium represents a very unique and bold approach to tackling one of the most vexing problems and potentially one of the most important problems for the advancement of information technology in the 21st century," he continued.

Nearly running our lives, computers are just about everywhere. When a computer fails, any number of things can go wrong — downtime results in hundreds of thousands of e-commerce dollars lost each hour. Computer failures in space endangers NASA mission success and computer software failure at the bank translates to no money at the ATM machine. All of these problems can be avoided by funneling time and effort into ensuring dependability of the software used to run computers.

During the three-day event, participants from industry, government and academia listened to keynote addresses, reviewed case studies and participated in technology discussions to start the wheels turning on the journey to software reliability. Speakers at the workshop based their presentations on past software failures, present capabilities and requirements for future computing to emphasize the importance of software dependability. Participants included specialists from the University of Southern California, Hewlett-Packard, NASA Goddard, Bell Laboratories, Department of Defense, and McMaster University, among others.

"I'm hoping that this will be the beginning of a continuous process by which we put together a long-term effort (20 or 50 years) to build not just the industry, but the field of computer science," says Jim Morris, dean of school of computer science of Carnegie Mellon University. The workshop planning committee plans to hold more events at Ames on computer software reliability in the near future.

By Holly A Amundson

Ames' youth-at-risk team wins the gold

photo by Tom Trower

Ames Research Center's youth-at-risk team from Foothill High School won the gold medal at the National FIRST Robotics competition at the Epcot Center at Disney World, in Orlando, FL, last year. This is a nationwide contest for high school teams. The robots are about 125 pounds each and are built from metal. Dr. McDonald was recently awarded one of two trophies given to the team, shown above, for their victory. Back row, left to right: Joe Hering, Vito Chiala, Jeff Jacobs, Center Director Harry McDonald, Steve Zornetzer, Bill Berry, Lewis Braxton, Flora Boyer, Eugene Tu, Tom Dyson, Larry Hogle, Cris Bent and Alan Federman. Front row, left to right: Mark Leon, Marisol Murguia, Glen Wyatt, Prudencio Murguia and Cynthia Escalera.

NASA makes the A-team for multicultural contract awards

NASA's Office of Small and Disadvantaged Business Utilization was recently named one of America's top 50 organizations for providing multicultural business opportunities. NASA received the honor after the first Internet-based election involving more than 50 thousand of America's leading women- and minority-owned businesses.

"As a premier, high-technology federal agency, we're happy to know that we're on the right track," said Ralph C. Thomas III, NASA's Associate Administrator for Small and Disadvantaged Business Utilization. "We consider this award to be an endorsement from the small- and multicultural-business community of the innovative programs and initiatives we implement to attract those firms that have provided us with high-quality goods and services at the lowest practicable cost."

Div2000.com, a business portal providing the link among multicultural businesses, Fortune 1000 companies, government agencies and universities, conducted the election.

Fiscal year 2000 was a banner year for NASA as the agency awarded more than $2 billion in contracts to minority- and women-owned firms. The figure represents 18.3 percent of NASA's total contract dollars and is NASA's highest accomplishment ever with such firms. It compares with just 7.2 percent or $865 million in FY 92.

The "top 50" list also included such companies as IBM, Boeing, Microsoft, 3Com, Wal-Mart and Cisco Systems. NASA's Office of Small and Disadvantaged Business Utilization is located at NASA Headquarters, Washington, D.C.

VPP STAR Tip:

"The purpose of the Voluntary Protection Programs (VPP) is to emphasize the importance of, encourage the improvement of, and recognize excellence in employer-provided, employee-participative, and generally site-specific occupational safety and health programs."

…Federal Register 65:45649-45663

Event Calendar

Model HO/HOn3 Railroad Train Club at Moffett Field invites train buffs to visit & join the club in Bldg. 126, across from the south end of Hangar One. Work nights are usually on Friday nights from 7:30 p.m. to 9:30 p.m. Play time is Sunday from 2 p.m. to 4 p.m. For more info, call John Donovan at (408) 735-4954 (W) or (408) 281-2899 (H).

Jetstream Toastmasters, Mondays, 12 noon to 1 p.m., N-269/Rm. 179. Guests welcome. POC: Samson Cheung at ext. 4-2875 or Lich Tran at ext. 4-5997.

Ames Bowling League, Tuesdays, at 6 p.m. at Palo Alto Bowl. Bowlers needed. POC: Mina Cappuccio at ext. 4-1313 or Carmen Park at ext. 4-1215.

Ames Ballroom Dance Club. Tuesdays: Rumba 1/30, 2/6, 2/13, Bolero 2/20, 2/27, 3/6, Salsa 3/13, 3/20, 3/27. 3 levels of classes, from Beg. to Int., 5:15 p.m. - 6:45 p.m. Classes in building 944, the Recreation Center. Women dancers are especially encouraged to join. POC: Helen Hwang at: hwang@dm1.arc.nasa.gov.

Ames Diabetics (AAD), meet twice a month on first and third Wednesdays, 12 noon to 1:00 p.m., in the Ames Café, far corner of the Sun room. Peer support group that discusses news that affects diabetics, both type I and II and exchange experiences in treatment and control and most importantly, help each other best cope with the disease. No cost, sales people, leader and medical professionals. Attend a meeting or call Bob Mohlenhoff at ext. 4-2523, or email him at bmohlenhoff@mail.arc.nasa.gov.

Ames Child Care Center Board of Directors Mtg, Every other Thursday (check website for meeting dates: http://accc.arc.nasa.gov), 12:00 noon to 2:00 PM, N269, rm. 201. POC: Katharine Lee, ext 4-5051.

Ames Asian American Pacific Islander Advisory Group Mtg, Feb 15, 11:30 a.m. to 1 p.m., N-237/Rm. 101. POC: Daryl Wong, ext. 4-6889 or Margaret Salas, ext. 4-6755.

Ames Amateur Radio Club, Feb 15, 12 noon, T28-N (across from N-255). POC: Michael Wright, KG6BFK, at ext. 4-6262. URL: http://hamradio.arc.nasa.gov

NFFE Local 997 Union General Mtg, Feb 21, noon to 1 p.m., Bldg. 19/Rm. 2017. Guests welcome. POC: Marianne Mosher at ext. 4-4055.

Native American Advisory Committee Mtg, Feb 27, 12 noon to 1 p.m., Ames Café. POC: Mike Liu at ext. 4-1132.

Environmental, Health and Safety Monthly Information Forum, Mar 1, 8:30 a.m. to 9:30 a.m., Bldg. 19/Rm 1040. POC: Linda Vrabel at ext. 4-0924.

Hispanic Advisory Committee for Employees, Mar 1, 11:45 a.m. to 12:30 p.m., N-241/Rm 237. POC: Mary R. Valdez, at ext. 4-5819.

Nat'l Association of Retired Federal Employees, (NARFE), San Jose Chapter #50, Mtg, Mar 2, at Hometown Buffett, Westgate Mall, 4735 Hamilton Av, San Jose. Prog. & bus. mtg. at 9 a.m., followed by lunch, $6.27, in a reserved area. Program starts at 9:30 a.m. followed by lunch. POC: Mr. Rod Perry (650) 967-9418 or NARFE 1-800-627-3394.

Ames Contractor Council Mtg, Mar 7, 11 a.m., N-200 Comm. Rm. POC: David Lawrence at ext. 4-6434.

Ames Classifieds

Ads for the next issue should be sent to *astrogram@mail.arc.nasa.gov* by the Monday following publication of the present issue and must be resubmitted for each issue. Ads must involve personal needs or items; (no commercial/third-party ads) and will run on space-available basis only. First-time ads are given priority. Ads must include home phone numbers; Ames extensions and email addresses will be accepted for carpool and lost & found ads only. Due to the volume of material received, we are unable to verify the accuracy of the statements made in the ads.

Housing

3 bd/1.5 ba, 2-story townhouse on Luz Avenue, San José. Freshly painted inside, dishwasher, gas heat, w/w carpeting, outside child play area/large patio. 1 car port. Easy access to H101/680/280. $295K. Azucena Guzman (408) 559-2881.

Live by the ocean! Manufactured home in Pacifica. One bedroom, yard (pets OK), swimming pool in park. 42K. Minutes to SF or to San Bruno Caltrain station. Call (415) 826-3041.

NRC senior research associate & spouse seek a furnished 2 bdrm apartment or house, Feb 1 to end July 2001. Interested in buying/leasing a cheap, used car for this period. Contact Sophie Wuerger, email to: s.m.wuerger@keele.ac.uk or by phone (+44 1782 752299 or +44 1782 584214) or by fax (+44 1782 583055).

Looking for a room to rent. I'm queit, clean & private. Close to Ames but not necessary. Please contact Rose (408) 292-4707.

Sunny, furnished room for rent in home in the Los Gatos/Campbell corner of San José for professional, N/S or outside smoker. Off-street parking, safe family neighborhood, central heat/air, utils included. Long term preferred,shorter term possible. Shared bath/kitchen. Lease/dep required. Call (650)604-6942, lv. msg.

Unfurnished room w/closet for rent in Redwood City. Avail: 3/1/01 or sooner. Kitchen privilages, share bathrm, use of washer/dryer, on/off street parking, some storage space in garage. Quiet neighborhood, not far from H84/101/280. Sorry no pets, N/S. Female preferred. $725/mo + sec dep. Utilities included, except phone. Call (650) 604-0559.

Triplex, 2 bedroom, 1 bath, private yard, shared enclosed garage, laundry room, water and garbage paid. 4375 Hamilton Ave, San Jose, $1,500/mo., no pets. 408-364-0545 evenings.

Room for rent: Avail. March 1 master. bdrm. in San José w/priv. bath. & locking door. Access to both highways 85 & 280. Shared 3 bdrm. duplex. $700/mo. + 1/3 utils. + $250 dep. Lv. msg. for Kevin or Luis (408) 723-2115.

For rent: furnished 2bd/1ba house in Sunnyvale, 15 min. to Ames. Avail Aug 2001 to Aug 2002. Outdoor jacuzzi w/priv. fence. $2,600/mo. Utils included. Call (408) 733-0304.

Miscellaneous

Anyone interested in forming a team to do the Avon Breast Cancer 3-Day walk in July? It's 60 miles from San Jose to San Francisco. www.breastcancer3day.org for details. Ann (408) 248-1985.

Sofa four years old, excellent condition, refurbished, paid $1,125, will sell for $250. Russ (408) 264-5050.

Wanted: Bunk bed with mattresses, preferably with full-size bottom bunk. Email: copernicus7@hotmail.com

Solaris 8 System Administration I SA-238 binder book, $500, Solaris 8 System Administration II SA-288 coursebook, $500, and Solaris 8 TCP/IP Network Administration SA-389, $525. Books assist with SUN Solaris 8 system administration certification and Sun certified network administrator. Joseph, work email: jkriz@mail.arc.nasa.gov (M-F before 10 a.m.); jkriz@Stanford.edu (M-F between 11 a.m. to 7:30 p.m.) or home email: Piranhas@Pacbell.net (anytime).

Rowing machine, Precor, almost new, light weight, folds for easy storage, orig. $195, asking $30. Call 408) 255-6917, eve.

Queen size futon, converts to sofa. Made of alder with beautiful custom cover. Orig. $750, asking $250. Like new. Ginny (408) 749-9179.

Yamaha PSR-240 portable electronic keyboard. 61 key with touch response. Featuring Yamaha Education Suite. Like new, still in box. Only played twice. Asking $100. Janice (408) 506-7573.

Wanted: Bunk bed with no bottom bed or sofa. Call (408) 263-2109 OK to leave message.

Light wood coffee table (exc cond) $50; security camera/monitor (still in box) $75; Chrome towel warmer (used once) $100; Sega Dreamcast (used once) $150; Electronic chess set (Kasparov/still in box) $85. PJ (650) 599-9829.

Transportation

'62 Jaguar Mark II; restoration project; $2,700 or B/O. Call (408) 263-1248.

'89 BMW 325i white ext/tan int 2D 5 speed 195K mls. Runs great. Sunroof, premium wheels, AM/FM stereo/cassette. Air, PS, PW, PL, cruise. $2,500 or B/O. Phil/Diana (650) 964-5404.

'90 VW Vanagon GL (blue), 160K mls, auto, new tires, brakes, shocks, smogged 12/00. Asking $4,200. Call (408) 274-2118.

'92 Ford Explorer XLT 4WD. Exc condition, 92.6K miles, 5spd manual, new tires, rear brakes, shocks. Green/tan exterior, tan interior. $6,500 or B/O. Call (510) 796-4311.

'99 Dodge 1500 truck aluminum rims 16"X7" wide $80 for all four. Like new. Scotty (408) 846-6722.

Carpools

Carpool wanted from Solano county (Fairfield/Benicia), to Ames. Willing to pick up riders enroute along H680. Days of week & times negotiable. Crystal at ext.4-6704 or email at: cwillingham@mail.arc.nasa.gov

Seeking those who would like to carpool from Sunset area of San Francisco. Contact David at ext 4-1120 or email dlambert@mail.arc.nasa.gov

Carpool wanted from Newark Area to Ames. Hours Flexible. Call Brent Beutter at ext. 4-5150 email: bbeutter@mail.arc.nasa.gov"

U.C./Fremont/Newark Carpool: Existing 3 person carpool would like to add 4th. Take turns driving from park & ride lot at Ardenwood & 84. Meet at 6am and leave Ames 3:30 or 4:00pm. Flexible with days person drives. Please contact Melissa at 4-3654 or mmallis@mail.arc.nasa.gov.

Ames public radio

1700 KHz AM radio -- information announcements & emergency instructions, when appropriate, for Ames employees.

Exchange Information

Information about products, services and opportunities provided as a service to the employee and contractor community by the Ames Exchange Council.

Beyond Galileo (8 a.m. to 2 p.m.)

A wide range of sale items and other products are currently available at the new gift shop adjoining the Ames Café.

Café Specials (6 a.m. to 2 p.m.)

Check out the Wednesday burrito special.

Visitor Center Shop (8 a.m. to 4 p.m.)

NASA logo merchandise, souvenirs, toys, gifts and educational items.

Tickets and Tours

Now open 8 a.m. to 2 p.m. in the Beyond Galileo gift shop for transit and other tickets.

Vacation Opportunities

Weekend getaway locations and cabins.

Lake Tahoe-Squaw Valley townhse, 3bd/2ba, view of slopes, close to lifts. Wkend $490, midwk $180 nite. Includes linens, firewood. Call (650) 968-4155, DBMcKellar@aol.com

South Lake Tahoe cottage with wood fireplace and hot tub. Rates from $50 to $130 per night. Call (650) 967-7659 or (650) 704-7732.

Ames scientists simulate hands-off jet landing

Imagine being able to land a jumbo jet without ever taking control of the stick. NASA scientists recently demonstrated just that, proving their ability to control a 757 jet simulation using only human muscle-nerve signals linked to a computer.

Ames scientists outfitted the pilot of the 757 jet simulation with an armband implanted with eight electrodes. The sensors read muscle nerve signals as the pilot makes the gestures needed to land a computer-generated aircraft at San Francisco International Airport in California. The pilot also demonstrated the ability to land a damaged aircraft during emergency landing drills. The work was reported in the October 2000 proceedings of the World Automation Congress.

"This is a fundamentally new way to communicate with machines -- another way to talk with our mechanical world," said the paper's principal author, Dr. Charles Jorgensen, head of the neuroengineering laboratory at Ames. The other authors are fellow Ames researchers Dr. Kevin Wheeler and Dr. Slawomir Stepniewski. "This new technology is significant in that neuroelectric control of computers can replace computer keyboards, mice and joysticks for some uses," Jorgensen added.

"In the experiment, a pilot closes his fist in empty air, makes movements and creates nerve signals that are captured by a dry electrode array on his arm," said Jorgensen. "The nerve signals are analyzed and then routed through a computer, allowing the pilot to control the simulated airplane."

photo by Tom Trower

An Ames 'pilot' outfitted with a heavily instrumented armband demonstrates the technique of using human muscle signals to fly and land a simulated aircraft.

The pilot sees the aircraft and control panel projected on a large, dome-shaped screen while flying the aircraft.

Engineers made the first prototype armband from exercise tights, and used metallic dress-buttons as dry electrodes. "An advantage of using neuroelectric machine control is that human nerve signals can be linked directly with devices without the aid of joysticks or mice, thereby providing rapid, intuitive control," Jorgensen said. "This technology also is useful for astronauts in spacesuits who need to control tools in space."

Neuroelectric control uses 'neural net' software that 'learns' patterns that can slowly change and evolve with time. The software can also combine many patterns together to generate a response.

Nerve signal patterns, each of which is potentially as unique as a fingerprint, are a perfect application for neural net software. A particular nerve-signal pattern tells muscles to move in a certain way. A computer can match each unique nerve-signal pattern with a particular gesture, such as making a fist or pointing. Scientists designed software that can adjust for each pilot's nerve patterns, and that is responsive to caffeine use, biorhythms, performance stress and the amount of fat under the skin.

To demonstrate bioelectric muscle control of the simulated 757 airplane during emergencies, researchers combined this

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